



FACT SHEET

NPDES Permit Number: AK-002249-7

Date: July 24, 2000

Public Notice Expiration Date: August 25, 2000

The United States Environmental Protection Agency (EPA) proposes to re-issue a National Pollutant Discharge Elimination System (NPDES) permit to:

CITY OF PALMER
231 W. Evergreen Ave.
Palmer, Alaska 99645

and requests the state of Alaska to certify this NPDES permit pursuant to 40 CFR Part 124.53 and issue a consistency determination.

NPDES Permit Re-Issuance

EPA proposes to re-issue an NPDES permit to the City of Palmer. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant effluent to the **Matanuska River** pursuant to the provisions of the Clean Water Act (CWA).

This Fact Sheet includes:

- C information on public comment, public hearing and appeal procedures;
- C a description of the current discharge;
- C a listing of past and proposed effluent limitations, schedules of compliance and other conditions;
- C a map and description of the wastewater discharge; and
- C detailed technical material supporting the conditions in the permit.

Alaska State Certification

EPA requests the Alaska Department of Environmental Conservation to certify the NPDES permit for the City of Palmer, under section 401 of the CWA. The state provided a preliminary certification prior to the Public Notice period and the stipulations have been incorporated or addressed in the fact sheet and draft permit.

Alaska State Consistency Determination

EPA requests the state of Alaska, Office of Management and Budget, Division of Governmental Coordination, to review this action for consistency with the approved Alaska Coastal Management Program.

Public Comment

Persons wishing to provide comments or request a Public Hearing for the proposed permit may do so in writing by the expiration date of the Public Notice. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearing must be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

Availability of Documents

The draft NPDES permit and other related documents can be obtained or reviewed by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (See address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at www.epa.gov/r10earth/water.htm.

United States Environmental Protection Agency (EPA)
Region 10
Park Place Building, 13th Floor
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-1214 or
1-800-424-4372

The draft permit and fact sheet are also available at:

United States Environmental Protection Agency (EPA)
Alaska Operations Office
222 W. 7th Ave #19
Anchorage, Alaska, 99513-7588
(907)271-6561

Palmer Library
655 S Valley Way
Palmer, AK 99645-6697

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ACRONYMS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
BMPs	Best management practices
BOD	Biochemical oxygen demand
BOD ₅	Biochemical oxygen demand, five-day
EC	Degrees Celsius
CFR	Code of Federal Regulations
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
HUC	Hydrologic Unit Code
lbs/day	Pounds per day
mg/L	Milligrams per liter
µg/L	Micrograms per liter
mgd	Million gallons per day
N	Nitrogen
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NR	Not required
OW	Office of Water
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAPP	Quality assurance project plan
TSD	Technical Support document (EPA, 1991)
TSS	Total suspended solids
TUc	Toxic units (chronic)
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Service
UV	Ultraviolet light
WET	Whole effluent toxicity
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

I. BACKGROUND

A. Applicant.

City of Palmer
Wastewater Treatment Plant (WWTP)

Facility Location:
231 W. Evergreen Ave.
Palmer, Alaska 99645

Facility Contact: Jim Vail, Public Works Superintendent
(907)745-3271

B. Activity.

The city of Palmer is located in the Matanuska-Susitna Borough. The city owns and operates a municipal wastewater treatment plant that provides secondary treatment and disinfection of wastewater prior to discharge in the Matanuska River. The facility currently serves a population of 4,318.

The plant receives domestic wastewater from residential and commercial sources and industrial wastewater from several sources. The industrial discharges contribute approximately 10,000 gallons per day to the treatment plant influent and are regulated by the City. The collection system has no combined stormwater/sanitary wastewater sewers.

C. Discharge.

The City of Palmer WWTP discharges treated effluent to the Matanuska River through outfall 001, located at latitude 61E33'36"N and longitude 149E06'30"W. The discharge enters the Matanuska River approximately 5 miles northeast of the entrance to the Knik Arm.

The facility's average design flow is 0.75 million gallons per day (mgd) and is currently discharging at a flow rate of 0.45 mgd. Treatment consists of a bar screen, flow measurements, aerated lagoons, polishing lagoon, and chlorination chamber. Details about the treatment process are discussed in Appendix A and a map showing the facility and discharge locations is provided in Appendix B.

- D. Facility History. The wastewater treatment facility at Palmer began operation in 1972. Palmer's lagoon facility was expanded in 1985 from a single lagoon to two alternately operated lagoon systems. In 1995, the facility began planning for plant upgrades. Completed upgrades include eight diffuser tubes installed in Pond #1, new blowers and blower building constructed, separated of Pond #2 with curtain baffle (now Ponds #2A and #2B), installed 11 diffuser tubes in Pond #2 (7 in Pond #2A and 4 in Pond #2B), converted from gaseous chlorine to sodium hypochlorite for disinfection, upgraded piping, and improved pond inlets. Planned upgrades include headworks modification, replacement of existing air tubing with flexible membrane diffusers (except Pond #3), installation of curtain baffles in Pond #3 to increase detention time, update automatic samplers, and enlarge chlorine contact chamber.
- E. Permit History.

<u>Date</u>	<u>Action</u>
1972	Facility placed into service.
March 1976	Initial permit issuance - contained secondary treatment requirements. Expiration date: September 1980.
October 1980	Permit re-issued. Expiration date: October 1985.
January 30, 1987	Permit re-issued. Expiration date: January 29, 1992
November 4, 1991	Short-form application received for permit re-issuance.
December 17, 1991	Long-form application received for permit re-issuance.
June 23, 1994	Permit re-issued. Expiration date: June 23, 1999
September 23, 1994	Permit modified: pH limits changed from 6.0-9.0 to 6.5-8.5, fecal coliform monitoring changed from weekly to 5/month, pretreatment program requirements were added, sludge management requirements were added, and surface water runoff and erosion protection was added.
December 28, 1998	Application received for permit re-issuance.

F. Plant Performance.

A review of the Discharge Monitoring Reports (DMRs) and Compliance Sampling Inspection Reports for the last five years shows that the Palmer facility has had problems complying with the terms of the current permit. Since the Ponds were cleaned out in 1998, the facility has been in compliance with the current permit, but the data shows that the loadings are increasing to points that would cause them to be out of compliance within 2-3 years. Unless the facility cleans their ponds out every 5 years, they will continue to have trouble meeting secondary requirements. The main reason for this is that the influent concentrations are low (127-446 mg/L) which would require better than 85% removal to obtain secondary treatment requirements. Therefore, equivalent to secondary requirements are proposed in the draft permit. A summary of the plant performance for the past five years is provided in Table I-1.

TABLE I-1. SUMMARY OF PLANT PERFORMANCE (1994-1999)			
Parameter	Units	Plant Performance	# Reported Violations
Flow	mgd	0.444	NA
Average Monthly Effluent BOD ₅	mg/L	10 - 63	17
	lbs/day	17 - 262	0
% Removal, BOD ₅	percent	73 - 96	9
Average Monthly Effluent TSS	mg/L	6 - 94	11
	lb/day	20 - 276	0
% Removal, TSS	percent	59 - 97	7
Average Monthly Fecal Coliform Bacteria	colonies/100 mL	<1 - 65	5
pH	s.u.	6 - 9	23

II. RECEIVING WATER

A. Description of Matanuska River, Alaska.

The Matanuska River is located in the Matanuska hydrologic basin (HUC 19020402). The river flows from the terminus of the Matanuska glacier through the Matanuska Valley, ultimately entering into the Knik Arm of Cook Inlet. The Palmer Hay Flats State Game Refuge is located at the mouth of the Matanuska River.

The annual flow of the river is characterized by low flows during the winter and peak flows during the summer due to glacial melts. The United States Geological Service (USGS) data from gaging station #15284000 indicate a 7Q10 flow of 349 cubic feet per second (cfs), a 1Q10 flow of 348 cfs, a 30Q5 flow of 360 cfs, and a harmonic mean of 1,026 cfs.

Approximately 0.5 miles upstream of the facility, the river splits and either flows through the north arm or the south arm. There is no pattern to indicate which way the river will flow each year. Since the facility discharges to the north arm, the flows from the USGS gaging station would apply when the river flows in this direction. However, when the river flows through the south arm, the flows are much less (the flow has not been measured previously). The State used twenty percent of the USGS gaging station flows to model the mixing zone because this is a braided river. Therefore, all calculations are based on twenty percent of the critical flows measured at the USGS gaging station.

B. Water Uses. The state of Alaska water quality standards (AAC, 1997) designates the following uses for the Matanuska River:

- C Water supply;
- C Water recreation; and
- C Growth and propagation of fish, shellfish, other aquatic life and wildlife.

C. Water Quality Standards. The following Alaska water quality standards are applicable to pollutants of concern for the Matanuska River:

18 AAC 70.015	Antidegradation
18 AAC 70.020	Protected Water Use Classes and Subclasses; Water Quality Criteria; Water Quality Standards Table
18 AAC 70.030	Whole Effluent Toxicity Limit
18 AAC 70.240	Mixing Zones: Department Authorization

18 AAC 70.245	Mixing Zones: Appropriateness and Size
18 AAC 70.250	Mixing Zones: General Conditions
18 AAC 70.255	Mixing Zones: In-Zone Quality and Size
18 AAC 70.260	Mixing Zones: Application Requirements
18 AAC 70.270	Mixing Zones: Termination, Modification, or Denial of Renewal
18 AAC 72 Article 1	Wastewater Disposal

D. Mixing Zone.

The CWA allows mixing zones (or zones of dilution in the receiving water body) at the discretion of the State when their water quality standards permit them. The state of Alaska water quality standards allows the exceedance of water quality criteria within a mixing zone authorized by ADEC when the receiving water quality meets state water quality standards. The allowed mixing zones do not impair the integrity of the water body as a whole, do not allow lethality to organisms passing through, and do not pose any serious health risks considering likely pathways of exposure.

In the case of a state approved mixing zone, the wasteload allocation (WLA) is calculated as a mass balance, based on the available dilution, background concentrations, and the State approved water quality criteria. When the receiving water exceeds the criterion for the pollutant or the State has not authorized a mixing zone for a particular pollutant, there is no dilution available for the effluent and the State adopted criterion becomes the WLA.

The State has authorized a mixing zone in its draft 401 certification. The mixing zone provides a minimum dilution factor of 43:1 and is defined as the area beginning at the confluence of the discharge stream and the Matanuska River, and extending downstream for 1600 meters. The maximum width of the mixing zone is 11 meters. If the State amends the mixing zone in the final 401 certification, then the reasonable potential determination and permit limits will be re-calculated for the final permit.

III. EFFLUENT LIMITATIONS

Sections 101, 301(b), 304, 308, 401, 402 and 405 of the CWA provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations in determining which conditions to include in the permit.

A. Pollutants of Concern.

In the permit application, the City of Palmer identified the following pollutants as being present in their discharge: Ammonia, Biochemical Oxygen Demand (BOD), fecal coliform bacteria, pH, silver, temperature, total residual chlorine, and Total Suspended Solids (TSS). In addition, EPA has identified dissolved oxygen (DO) and residues as pollutants of concern due to the nature of the discharge. A discussion on whole effluent toxicity (WET) is provided because it was a pollutant of concern for the current permit.

Each of these pollutants will be discussed in section III.E, below. The discussion will include applicable technology-based standards and a determination whether there is reasonable potential for violation of water quality standards. Where reasonable potential exists, limits are developed and are incorporated into the draft permit.

B. Determining Reasonable Potential.

The CWA requires NPDES permitted discharges to demonstrate compliance with state water quality standards. In order to determine compliance with water quality standards, ambient (upstream) and effluent monitoring data are used in a mass balance equation to determine if the maximum observed effluent concentration has the potential to exceed chemical specific water quality criteria under critical stream conditions. If the projected downstream concentration has the potential to exceed the criteria, then a permit limit is developed for that pollutant.

Pollutants present in the effluent for which the State has not adopted numeric criteria, but which may be contributing to an excursion above a narrative criterion, must also be investigated to determine if permit limits are needed. In such cases, limits are established using one of three options: (1) use EPA's national criteria, (2) develop criteria, or (3) control the pollutant through the use of an indicator. Refer to Appendix C for a more detailed explanation of how reasonable potential is determined.

- C. Effluent Limit Development. Effluent limitations are developed from technology available to treat the pollutants (technology-based limits) and limits that are protective of the designated uses of the receiving water (water quality-based limits). The proposed permit will reflect whichever limits (technology-based or water quality-based) are more stringent.

1. Technology-based Limits.

In general, EPA first determines which technology-based limits are required to be incorporated into the permit (40 CFR 122.44[a]), as well as best management practices or other requirements. Technology-based limits for publicly owned treatment works (POTWs) are derived from secondary treatment standards (40 CFR 133.102) or equivalent to secondary treatment standards (40 CFR 133.105) and based on end-of-pipe technology. For POTWs, technology-based limits cover three parameters: five day Biochemical Oxygen Demand (BOD₅), total suspended solids (TSS) and pH.

2. Water Quality-based Limits.

The first step in developing water quality-based limits is to determine the wasteload allocation (WLA) and the time frame over which the WLAs apply. In general, the period over which a criterion applies is based on the length of time the target organism can be exposed to the pollutant without adverse effect. For example, aquatic life criteria generally apply as one-hour averages (acute criteria) or four-day averages (chronic criteria). Finally, the WLAs are statistically converted to maximum daily and monthly average permit limits. In translating the WLA into permit limits, EPA followed the procedures in the Technical Support Document (TSD; EPA, 1991). Refer to Appendix C for a more detailed explanation of permit limit derivation.

- D. Summary of Draft Permit Limitations. Table III-1 presents the City of Palmer WWTP effluent limitations for the draft permit. For comparison purposes, the table also shows the effluent limitations of the current permit. When converting concentrations to mass loadings, the concentration was multiplied by the design flow of 0.75 million gallons per day and a conversion factor of 8.34 to obtain the units of pounds per day.

TABLE III-1. PROPOSED EFFLUENT LIMITATIONS									
PARAMETER	UNITS	MONTHLY AVERAGE		WEEKLY AVERAGE		MAXIMUM DAILY		MINIMUM DAILY	
		Current t (1994)	Draft (2000)	Current t (1994)	Draft (2000)	Current t (1994)	Draft (2000)	Current t (1994)	Draft (2000)
Ammonia (as N)	mg/L	---	34	---	---	---	71	---	---
	lbs/day	---	200	---	---	---	430	---	---
BOD ₅	mg/L	30	30	45	45	60	60	---	--
	lbs/day	150	188	225	281	---	375	---	---
	% removal	85	85	---	---	---	---	---	---
DO	mg/L	---	---	---	---	---	---	---	2
Fecal Coliform ²	FC/100 mL	20	20 ⁴	---	---	40	40	---	---
Fecal Coliform ³	FC/100 mL	---	100 ⁴	---	---	---	200	---	---
Flow	mgd	---	---	---	---	---	0.75	---	---
pH	s.u.	---	---	---	---	8.5	8.5	6.5	6.5
TSS	mg/L	45	45	65	65	---	---	---	---
	lbs/day	225	281	325	407	---	---	---	---
	% removal	85	65	---	---	---	---	---	---
Total Residual Chlorine ¹	µg/L	---	1.7	---	---	---	3.4	---	---
	lbs/day	---	0.01	---	---	---	0.02	---	---
<p>1 The effluent limit for chlorine is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limits provided the total chlorine residual is at or below the compliance evaluation level of 0.100 mg/L (100 µg/L).</p> <p>2 This limitation applies when the permittee uses chlorine to disinfect the effluent.</p> <p>3 This limitation applies when the permittee uses an alternative disinfection method (e.g., ultraviolet light or ozonation).</p> <p>4 Based on the geometric mean of all samples collected during the month.</p>									

E. Evaluation of Pollutants for Effluent Limitations.

1. Ammonia, total (as Nitrogen).

Ammonia is a pollutant of concern at the Palmer facility because of its toxic effects on aquatic species and since it is commonly found in sewage treatment plant discharges. Alaska criteria for ammonia are based on calculations that take into account ambient temperature and pH.

The EPA in Region 10 uses the 95th percentile of temperature and pH data for the receiving water body upstream of the facility to determine the criterion for ammonia. The basis for this is that ammonia exists in its non-ionized form only at higher pH levels and is most toxic in this state. Therefore, the water quality criterion for aquatic life requires an acute maximum receiving water concentration of 5.3 mg/L and a chronic maximum receiving water concentration of 1.02 mg/L based on a temperature of 10°C and pH of 8.15.

An analysis was performed to determine if this pollutant had reasonable potential to violate water quality standards (See Appendix C). The ADEC has authorized a dilution of 43:1. Since reasonable potential was determined, a limit has been imposed on the effluent based on the most limiting criterion for aquatic life. The data set shows that the facility will be able to comply with the proposed limits.

The draft permit proposes a maximum daily limit of 71 mg/L (430 lbs/day) and a monthly average limit of 34 mg/L (200 lb/day).

2. Biochemical Oxygen Demand, five-day (BOD₅).

The City of Palmer WWTP is a secondary treatment facility that is subject to the federal technology-based requirements for BOD₅. These requirements state that the 30-day average shall not exceed 30 mg/L, the 7-day average shall not exceed 45 mg/L, and the 30-day average percent removal shall not be less than 85 percent. Additionally, the Alaska water quality standards require that the daily maximum discharge shall not exceed 60 mg/L BOD₅.

Historical data from the permittee indicates that the facility has not been able to comply with these limits while properly operating and maintaining the facility. The main reason for this is that the influent concentrations are so low that the facility must do better than 85% removal to meet the secondary treatment requirements. Consequently, the facility is eligible for equivalent to secondary treatment

requirements. However, the facility has been doing major upgrades to the facility that may provide the facility with the means of meeting secondary treatment standards.

The Alaska Department of Environmental Conservation has received a State discharge application from the permittee that indicates the facility would be able to meet secondary treatment standards for BOD₅. The State has had conversations with the facility operators and has reviewed discharges from similar facilities and believe that the facility would be able to meet BOD₅ secondary treatment standards. Therefore, the ADEC has indicated in their preliminary certification that the facility meet secondary treatment standards for BOD₅.

Secondary treatment requirements have been incorporated into the draft permit as both concentration limits and loading limits. The loadings are determined by multiplying the proposed limitation in concentration (mg/L) by the design flow (0.75 mgd) and a conversion factor of 8.34 (to convert from mg/L to lb/day).

The draft permit proposes the following BOD₅ limits: 30 mg/L (188 lb/day) average monthly limit with 85% removal, 45 mg/L (281 lb/day) average weekly limit, and 60 mg/L (375 lb/day) maximum daily limit.

3. Dissolved Oxygen (DO).

The Alaska water quality standards require the surface DO concentration in fresh water to be greater than or equal to 7.0 mg/L and greater than or equal to 5.0 to a depth of 20 centimeters in the interstitial waters of gravel used by anadromous or resident fish for spawning. Further, DO concentrations may not exceed 17 mg/L or 110% of saturation at any point of sample collection.

There is no data available to indicate that there is a DO problem in the Matanuska River. However, the ADEC has requested that the permit include a DO limit of 2 mg/L with a dilution factor of 43:1.

The draft permit proposes a minimum daily limit of 2 mg/L.

4. Fecal Coliform Bacteria.

Fecal coliform is a non-pathogenic indicator species whose presence suggests the likelihood that pathogenic bacteria are present. Alaska water quality require that the instream concentration of fecal coliform bacteria not exceed 20 FC/100 mL based on the geometric mean of all samples taken in a 30-day period and not more than 10% of the samples may exceed 40 FC/100 mL. In the current permit, the requirement that 10% of the samples not exceed 40 FC/100 mL was interpreted as a maximum daily limit. Since the facility was able to comply with this limitation in their current permit, they do not meet the requirements for antibacksliding.

The ADEC promotes the use of alternative methods of disinfection (such as ultraviolet light) to eliminate and/or minimize the use of disinfection chemicals. Therefore, the ADEC has requested that the permit provide alternative fecal coliform limits when other means of disinfection are used by the permittee. The ADEC has authorized that the effluent discharged from the facility not exceed a 30-day geometric mean of 100 FC/100 mL and a daily maximum of 200 FC/100 mL based on a dilution of 43:1.

The limits proposed in the draft permit are the same as those in the current permit for chlorine disinfection. Therefore, it is anticipated that the facility will be able to comply with these limits. A review of the facility performance over the past three years indicates that the facility will be able to meet these limits.

Alternative limits have been included in the event that the facility decides to use another means of disinfection. Monitoring of the receiving water, upstream and downstream of the outfall, has been included in the draft permit to ensure that the water quality standards have been met at the edge of the mixing zone.

The draft permit is proposing the following fecal coliform limits: when chlorine disinfection is used, 20 FC/100 mL average monthly limit and 40 FC/100 mL maximum daily limit; when an alternative disinfection method is used, 100 FC/100 mL average monthly limit and 200 FC/100 mL maximum daily limit.

5. Flow. Flow has been limited to the design flow of the facility because the State has proposed this requirement in their preliminary certification.

The draft permit is proposing that the daily maximum flow limitation of 0.75 mgd.

6. pH.

The technology-based limitation, based on federal regulations (40 CFR Part 133.102) is 6.0 to 9.0 standard units. The most stringent Alaska water quality standards give an allowable pH range of 6.5 to 8.5 standard units, however, the pH in the receiving water may not vary more than 0.5 pH units from natural background conditions. Since the more limiting case applies, the Alaska water quality limit will apply to the facility's effluent. The ADEC has authorized a dilution factor of 45:1 to allow mixing of the effluent pH with the natural background conditions. It is anticipated that the pH will vary more than 0.5 pH units from the natural background at the edge of the mixing zone.

The limits proposed in the draft permit are the same as those in the current permit, and a review of the facility performance over the past year indicates that the facility will be able to meet these limits. Therefore, it is anticipated that the facility will be able to comply with these limits.

The draft permit proposes a pH limit of 6.5 to 8.5 standard units.

7. Residues.

The Alaska water quality standards require surface waters of the state to be free from floating solids, debris, sludge, deposits, foam, scum, or other residues of any kind in concentrations causing nuisance, objectionable, or detrimental conditions or that make the water unfit or unsafe for the use. Residues may not, alone or in combination with other substances or wastes, (1) make the water unfit or unsafe for the use; (2) cause acute or chronic problem levels as determined by bioassay or other appropriate methods; (3) cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; (4) cause leaching of toxic or deleterious substances; or (5) cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.

The current permit states that there shall be no discharge of floating solids or visible foam, or oily wastes which produce a sheen on the surface of the receiving water. The limit proposed in the draft permit has been updated to reflect the water quality standard for residues.

The draft permit proposes that the facility meet a narrative standard for residues.

8. Silver.

The water quality criterion for aquatic life requires an acute maximum receiving water concentration of 8.34 µg/L based on a hardness of 152 mg/L. The water quality criterion for human health requires a maximum receiving water concentration of 50 µg/L and the water quality criterion for drinking water requires a maximum receiving water concentration of 100 µg/L.

An analysis was performed to determine if this pollutant had reasonable potential to violate water quality standards (See Appendix C). The ADEC has authorized a dilution of 43:1. Since reasonable potential was not determined, no limit has been imposed on the effluent.

No limit for silver is proposed in the draft permit.

9. Temperature.

The most stringent Alaska water quality standard for temperature require that waters exhibit temperatures at or below fifteen (15) degrees C.

The facility has conducted some self-monitoring for temperature of their effluent. The maximum daily temperature recorded over the last two years was 19.3EC, which is 4.3EC greater than allowed by the Alaska standards. Considering the flow regime and temperature gradients of the receiving water, the effluent temperature is not likely to increase the receiving water temperature to levels that would violate the water quality standards. Therefore, no limits will be imposed on the facility.

No limit for temperature is proposed in the draft permit.

10. Total Residual Chlorine.

The Palmer WWTP uses chlorine contact to disinfect the effluent for control fecal coliform bacteria. The most stringent state water quality criteria for total residual chlorine to protect designated uses requires that concentrations may not exceed 19 µg/L for acute aquatic life and 2.0 µg/L for chronic aquatic life.

An analysis was performed to determine if this pollutant had reasonable potential to violate water quality standards (See Appendix C). The ADEC has authorized a dilution factor of 43:1, however, EPA has not incorporated the dilution in the development of the proposed limits because it is EPA's position that the residual chlorine should be limited in the effluent to reduce toxicity effect to fish species in the receiving water. Therefore, reasonable potential was established with no dilution and a limit has been imposed on the effluent based on the most limiting criterion of chronic aquatic life. The facility has installed a dechlorination unit, thus it is anticipated that the facility will be able to comply with the proposed limits.

Since the criterion is below the capability of current analytical technology's ability to detect chlorine for the DPD method cited in 40 CFR Part 136, the detection limit¹ of 0.100 mg/L will be the compliance evaluation level.

The draft permit proposes a maximum daily limit of 3.4 µg/L (0.02 lbs/day) and an average monthly limit of 1.7 µg/L (0.01 lbs/day) with a compliance limit of 0.100 mg/L (100 µg/L) based on the DPD method approved in 40 CFR Part 136.

11. Total Suspended Solids (TSS).

The City of Palmer WWTP is a secondary treatment facility that is subject to the federal technology-based requirements for TSS. In the previous permit, the facility was granted equivalent to secondary limits because they were not able to meet the requirements for secondary treatment while properly operating and maintaining the facility. The requirements for equivalent to secondary treatment requires that the 30-day average shall not exceed 45 mg/L, the 7-day average shall not

¹The detection limit is the minimum concentration that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero.

exceed 65 mg/L, and the 30-day average percent removal shall not be less than 65 percent.

Since the plant was recently upgraded in 1998, the facility data shows that the plant is still unable to comply with the requirements for secondary treatment. These requirements state that the 30-day average shall not exceed 30 mg/L, the 7-day average shall not exceed 45 mg/L, and the 30-day average percent removal shall not be less than 85 percent. Therefore, the equivalent to secondary limitations are incorporated into the permit as both concentration limits and loading limits. No daily maximum limit is imposed on this facility because the state water quality standards do not give provisions for equivalent to secondary treatment in their standards.

In the current permit, the percent removal is 85 percent. It is believed that this is a technical error since the fact sheet corresponding with the current permit states that the TSS limits are based on equivalent to secondary treatment requirements and provides no reference to increasing the percent removal from 65 percent (previous permit) to 85 percent (current permit). The equivalent to secondary treatment standards state that the percent removal shall not be less than 65 percent.

The loadings are determined by multiplying the proposed limitation in concentration (mg/L) by the design flow (0.75 mgd) and a conversion factor of 8.34 (to convert from mg/L to lb/day).

The draft permit proposes the following TSS limits: 65 mg/L (407 lb/day) average weekly limit, and 45 mg/L (281 lb/day) average monthly limit with 65% removal.

12. Whole Effluent Toxicity (WET).

The discharge of chemicals in toxic amounts is prohibited pursuant to Section 101(a)(3) of the CWA and the Alaska water quality standards (18 AAC 70.020), which prohibits the discharge of toxic pollutants in toxic amounts. Alaska water quality standards require that there may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, toxic effects on aquatic life. These standards also state that individual substances may not exceed criteria for toxics.

The intent of monitoring whole effluent toxicity (WET) is to measure the aggregate effect of all toxicants in the effluent. The municipal application regulations (40 CFR Part 122.21[j][1]) require POTWs with design influent flows equal to or greater than 1.0 mgd, and POTWs with approved pretreatment programs, to submit results of WET testing with their permit application. Additionally, EPA regulations at 122.44(d)(1) in effect require whole effluent data and criteria when characterizing effluents. The state of Alaska water quality criteria for whole effluent toxicity requires that the chronic criterion of 1.0 TUC be met at the point of discharge or at the edge of the mixing zone, if one is granted.

During the last permitting cycle, the City of Palmer was required to conduct chronic toxicity tests on their effluent. The tests showed that the effluent was not toxic and that there was no reasonable potential to violate water quality standards.

The draft permit does not include any WET requirements for the following reasons: the facility's design flow is less than that required by federal regulation for WET monitoring, there is currently no pretreatment program requirements for this facility, and the previous tests indicate no toxicity.

- F. Antidegradation. In proposing to reissue this permit, EPA as considered Alaska's antidegradation policy. This provision states that "the existing instream water uses and the level of water quality necessary to protect the existing uses will be maintained and protected." This policy is designed to protect existing water quality when the existing water quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. The draft permit will result in decreases in the authorized pollutant loadings to the

Matanuska River. Therefore, the draft permit will not result in degradation of water quality and is consistent with Alaska's antidegradation policy.

IV. MONITORING REQUIREMENTS

A. Effluent Monitoring.

1. Proposed Effluent Monitoring Requirements. The permittee is responsible for conducting the monitoring required in Table IV-1 and for reporting results with Discharge Monitoring Reports (DMRs) to EPA. Table IV-1 presents the proposed effluent monitoring requirements for the draft permit. For comparison purposes, the table also includes the monitoring requirements of the current permit.

TABLE IV-1: EFFLUENT MONITORING REQUIREMENTS				
PARAMETER	UNITS	SAMPLE FREQUENCY		SAMPLE TYPE
		Current Permit (1994)	Draft Permit (2000)	
Ammonia, total (as N)	mg/L	monthly	5/month	grab
BOD ₅	mg/L	weekly	1/week	24-hour timed composite
DO	mg/L	NR ¹	1/month	grab
Fecal coliform bacteria	FC/100 mL	5/month	5/month	grab
Flow	mgd	continuous	continuous	recording
pH	s.u.	5/week	5/week	grab
Residue	---	NR ¹	1/week	visual
Temperature	EC	5/week	5/week	grab
Total residual chlorine ²	mg/L	5/week	2/week	grab
TSS	mg/L	weekly	1/week	24-hour timed composite
WET	TU ₆	annual	NR ¹	24-hour composite
¹ Not required. ² This monitoring is only required when the permittee uses chlorine to disinfect the effluent.				

2. Basis for Effluent Monitoring. Section 308 of the CWA and federal regulation 40 CFR Part 122.44(i) requires that monitoring be included in

permits to determine compliance with the effluent limitations in Table III-1. Additionally, monitoring may be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. Monitoring the effluent for DO, flow, hardness and temperature are included as a condition of the draft permit to determine water quality impacts in the Matinuska River.

3. **Monitoring Frequency.** Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Ammonia, total residual chlorine, and silver monitoring frequency was determined using statistics (see Appendix C). Monitoring of hardness is included as a condition of the draft permit to determine water quality impacts for silver. Therefore, the monitoring frequency is the same as that for silver and the facility is required to conduct monitoring of hardness and silver on the same date. BOD and TSS data did not indicate an allowance for reduced monitoring. Since the facility has had several violations for pH during the past 5 years, no monitoring reduction is authorized and the monitoring frequency will remain at 5/week.

B. Influent Monitoring.

1. **Proposed Influent Monitoring Requirements.** The permittee is responsible for conducting the monitoring and for reporting results with Discharge Monitoring Reports (DMRs) to EPA. Table IV-2 presents the proposed influent monitoring requirements for the draft permit. For comparison purposes, the table also includes the monitoring requirements of the current permit.

TABLE IV-2: INFLUENT MONITORING REQUIREMENTS ¹				
PARAMETER	UNITS	SAMPLE FREQUENCY		SAMPLE TYPE
		Current Permit (1994)	Draft Permit (2000)	
BOD ₅	mg/L	weekly	1/week	24-hour composite
TSS	mg/L	weekly	1/week	24-hour composite
1 Influent monitoring is required to be performed within same 24-hour period as effluent monitoring for like parameters.				

2. Basis for Influent Monitoring. Section 308 of the CWA and federal regulation 40 CFR Part 122.44(i) requires that monitoring be included in permits to determine compliance with effluent limitations. The federal regulation 40 CFR Part 133.105 require that the plant remove 65 percent of the BOD₅ and TSS entering the treatment works. Therefore, influent monitoring is required to ensure that the plant is operating efficiently and meeting the appropriate percent removal requirements for BOD₅ and TSS.
3. Monitoring Frequency. Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Therefore, influent monitoring is required to occur on the same date as effluent monitoring.

C. Ambient Monitoring.

1. Proposed Ambient Monitoring Requirements. The permittee is responsible for conducting the monitoring and for reporting results with Discharge Monitoring Reports (DMRs) to EPA. Table IV-3 presents the proposed ambient monitoring requirements for the draft permit. For comparison purposes, the table also includes the monitoring requirements of the current permit.

TABLE IV-3: AMBIENT MONITORING REQUIREMENTS					
PARAMETER	UNITS	SAMPLE FREQUENCY		SAMPLE LOCATION	SAMPLE TYPE
		Current Permit (1994)	Draft Permit (2000)		
Ammonia, total (as N)	mg/L	NR ¹	1/quarter ³	upstream & downstream ⁵	grab
BOD ₅	mg/L	NR ¹	1/quarter ³	upstream	grab
DO	mg/L	NR ¹	1/quarter ³	upstream & downstream ⁵	grab
Fecal coliform bacteria (May 1 - September 31)	FC/100 mL	NR ¹	1/month	upstream & downstream ⁵	grab
Fecal coliform bacteria (October 1 - April 30)	FC/100 mL	NR ¹	1/quarter ³	upstream & downstream ⁵	grab
Flow	mgd or cfs	NR ¹	1/quarter ³	upstream	grab
	and ft/sec.				
pH	s.u.	NR ¹	1/quarter ³	upstream & downstream ⁵	grab
Residue	---	NR ¹	1/quarter ³	downstream ⁵	visual
Temperature	EC	NR ¹	1/quarter ³	upstream & downstream ⁵	grab
Total residual chlorine ⁴	µg/L	1/quarter ²	1/quarter ³	upstream & downstream ⁵	grab
¹ Not required. ² During the months of January, April, July and October. ³ During the months of February, May, August and November. ⁴ This monitoring is only required when the permittee uses chlorine to disinfect the effluent. ⁵ Downstream monitoring shall occur at two locations at the edge of the mixing zone (or as close to the edge of the mixing zone as is practical due to site and access limitations).					

2. Basis for Ambient Monitoring. The purpose of ambient monitoring is to determine water quality conditions as part of the effort to evaluate the reasonable potential for the discharge to cause an instream excursion above water quality criteria. Upstream monitoring is used to determine water quality impacts while downstream monitoring is used to ensure

compliance with the water quality standards. Once it has been established (after one permit cycle) that the discharge does not cause an exceedance of water quality standards, the downstream monitoring is no longer necessary. Since the purpose of ambient monitoring is to determine water quality impacts due to the effluent discharge, ambient monitoring is required to occur on the same date as effluent monitoring.

3. Monitoring Frequency. Monitoring frequencies are based on the nature and effect of the pollutant.

V. SPECIAL CONDITIONS

A. Sludge Management.

The proposed NPDES wastewater permit no longer contains requirements related to sewage sludge. EPA Region 10 has recently decided to change the regional approach to permitting the disposal of biosolids (“sewage sludge” or “sludge”) and to separate wastewater and sludge into separate permits. EPA will issue a sludge only permit to this facility at a later date. Sludge permit coverage may be in the form of a general permit in which EPA can cover and better serve multiple facilities with similar limitations and management requirements.

The Clean Water Act (CWA) prohibits the use or disposal of biosolids not in compliance with 40 CFR 503 and provides EPA with the authority to enforce these regulations directly (even in the absence of a permit). Removal of specific sewage sludge requirements from the proposed permit does not violate the CWA and does not preclude the facility from complying with the requirements of these regulations. The state of Alaska currently conducts a program to regulate the management of biosolids. If the applicant performs sludge activities in accordance with the federal and state regulations, the environment should be protected until such time as a sludge only permit is prepared for this facility.

The proposed permit requires the permittee to update the biosolids permit application for this facility as necessary.

B. Quality Assurance Project Plan (QAPP). The federal regulations at 40 CFR Part 122.41(e) requires the permittee to properly operate and maintain all facilities and systems of treatment and control which are installed and used by the permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Therefore, this permit requires the permittee to develop a QAPP that will assist in planning for the collection and analysis of samples in support of the permit and in explaining data anomalies when they occur. The proposed permit requires the permittee to submit a QAPP within 180 days of the effective date of the permit.

C. Best Management Practices (BMPs).

Section 402 of the CWA and federal regulation 40 CFR Part 122.44(k) authorize EPA to require best management practices (BMPs) in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility Operation & Maintenance (O&M) plans. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires that the permittee develop a plan and implement BMPs within 180 days of permit issuance. EPA has a guidance manual (EPA, 1993) that may provide some assistance in the development of BMPs. Specifically, the permittee must consider spill prevention and control, optimization of chemical use, public education aimed at controlling the introduction of household hazardous materials to the sewer system and water conservation. Furthermore, it is considered a good management practice to maintain a log of daily plant operations and observations.

To the extent that any of these issues have already been addressed, the permittee need only reference the appropriate document/section in its O&M. Additionally, the BMP operating plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

D. Pretreatment Study.

Section 301(b) of the Clean Water Act (CWA) requires that industrial users who discharge to publicly owned treatment works comply with pretreatment requirements established under Section 307 of the CWA. The objectives of the pretreatment program are: 1) to prevent the introduction of pollutants to the treatment system that will interfere with the plant's operation, could pass through the system untreated and contribute to water quality problems, or otherwise be incompatible with the treatment plant, and 2) to improve opportunities to reclaim and recycle municipal and industrial waste water sludges.

The pretreatment regulations require the City to enforce pretreatment standards promulgated under Section 307 of the CWA. In support of the regulations, the draft permit proposes that the City issue permits to categorical and significant industrial users (CIUs and SIUs). The permits should contain discharge limits and other conditions, such as records maintenance, inspection and monitoring requirements, and enforcement actions for non-compliance.

Additionally, the draft permit proposes that the city implement certain requirements in support of the federal pretreatment regulations. This includes updating the current sewer use ordinance (adopted in 1980) to comply with changes in the federal pretreatment regulations and monitoring the influent and effluent of the treatment plant for metals and cyanide for the first year. The data results will be submitted to the Pretreatment Coordinator at EPA and used to calculate local limits for the industrial discharges to the POTW.

E. Signage.

The ADEC has required the permittee to post signs at the shoreline of the Matanuska River near the outfall and the edge of the mixing zone (approximately 1600 meters downstream of the outfall). In accordance with AS 46.03.110(d), the ADEC may specify in a permit the terms and conditions under which waste material may be disposed of. The notification requirement is intended to inform and provide assurances to the public that the wastewater is being treated in accordance with state of Alaska Water Quality Standards (18 AAC 70). Therefore, the draft permit proposes that these signs be posted by the permittee.

VI. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act.

The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if the agency's actions could beneficially or adversely affect any threatened or endangered species. Therefore, EPA requested a listing of threatened or endangered species in the vicinity of the City of Palmer WWTP from NMFS and USFWS on October 13, 1999.

In a letter dated November 16, 1999, the USFWS indicated that there were no listed species or critical habitats within the projected area and they did not anticipate the proposed activity to impact since none are located in the vicinity of the projected activity. The NMFS, in a letter dated October 22, 1999, did not identify any endangered species in the vicinity of the discharge and indicated that they did not expect the proposed activity to threaten or endanger species in the projected area. Therefore, EPA has determined that the proposed discharge will have no effect and further consultation with the services is not required.

B. Essential Fish Habitat (EFH).

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge, therefore no consultation is required. This fact sheet and the draft permit will be submitted to NMFS for review during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to final issuance of this permit.

The NMFS has requested that EFH assessments contain the following requirements:

1. List EFH species in the facility area. In a letter dated October 22, 1999, the NMFS stated that the Matanuska River has been designated to

support the following species for EFH: king, sockeye, coho, pink and chum salmon.

2. Describe the facility and discharge location. The facility activities and wastewater sources are described in Part I.B and C of this Fact Sheet, and the discharge location is described in Part II.A.
 3. Evaluate potential effects to EFH. The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge for the following reasons:
 - (1) The proposed permit has been developed in accordance with the Alaska water quality standards to protect aquatic life species in the Matanuska River. NPDES permits are established to protect water quality in accordance with State water quality standards. The standards are developed to protect the designated uses of the waterbody, including growth and propagation of aquatic life and wildlife. Self-monitoring conducted by the applicant indicates that the facility will be able to comply with all limits of the proposed permit.
 - (2) The derivation of permit limits and monitoring requirements (refer to Section III of this fact sheet for specifics pertaining to the proposed permit) for an NPDES discharger include the basic elements of ecological risk analysis as specified in the TSD (EPA, 1991). This analysis includes, but is not limited to, the following: effluent characterization, pollutants of concern identification, threshold concentration determination, exposure considerations, dilution modeling and analysis, multiple sources and natural background consideration, fate and transport variability, and monitoring duration and frequency.
 - (3) In a letter dated October 22, 1999, the NMFS has indicated that there are no critical habitats in the vicinity of the discharge.
- C. State Certification. Since this permit authorizes discharge to Alaska State waters, Section 401 of the CWA requires EPA to seek State certification before

issuing a final permit. This certification by the State ensures that federally issued permits are in compliance with the laws of the State. EPA is requesting Alaska State officials to review and provide appropriate certification to this NPDES permit pursuant to 40 CFR Part 124.53. Additionally, in accordance with 40 CFR Part 124.10(c)(1), public notice of the draft permit has been provided to the state of Alaska agencies having jurisdiction over fish, shellfish , and wildlife.

- D. Coastal Zone Management Act (CZMA). The applicant has certified that the activities authorized by the draft permit are consistent with the Alaska Coastal Management Plan. Pursuant to 40 CFR Part 122.49(d), requirements of the State coastal zone management program must be satisfied before the permit may be issued.
- E. Permit Expiration. This permit will expire five years from the effective date of the permit.
- F. Facility Changes or Alterations. The facility is required to notify EPA of any planned physical alteration or operational change to the facility in accordance with 40 CFR Part 122.41(1). This requirement has been incorporated into the proposed permit to ensure that EPA and ADEC are notified of any potential increases or changes in the amount of pollutants being discharged. This will allow evaluation of the impact of the pollutant loading on the receiving water.

VII. REFERENCES

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control*. U.S. Environmental Protection Agency, Office of Water, EPA/505/2-90-001, March 1991.

EPA. 1993. *Guidance Manual for Developing Best Management Practices (BMP)*. U.S. Environmental Protection Agency, Office of Water, EPA/833/B-93-004.

EPA. 1996. *U.S. EPA NPDES Permit Writer's Manual*. U.S. Environmental Protection Agency, Office of Water, EPA/833/B-96-003.

AAC. 1997. *Water Quality Standards*. Alaska Department of Environmental Conservation, 18 AAC 70.

NMFS. 1998. *Habitat Assessment Reports for Essential Fish Habitat*. National Marine Fisheries Service, North Pacific Fishery Management Council, and Alaska Department of Fish & Game.